



Forest Health Protection Pacific Southwest Region



Date: October 6, 2011

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To: District Ranger, Upper Lake Ranger District, Mendocino National Forest

Subject: Evaluation of insect and disease activity in the Lakeview Project Area
(FHP Report N11-15)

At the request of Gary Urdahl, Upper Lake District Silviculturist, a field evaluation of the Lakeview Project was conducted on October 5, 2011. The objectives were to assess the current stand conditions and evaluate the project for potential funding through the Forest Health Protection (FHP) Western Bark Beetle Initiative. Gary Urdahl, Frank Aebly, Randall Walker (Mendocino NF) and Cynthia Snyder (FHP) were in attendance.

Background

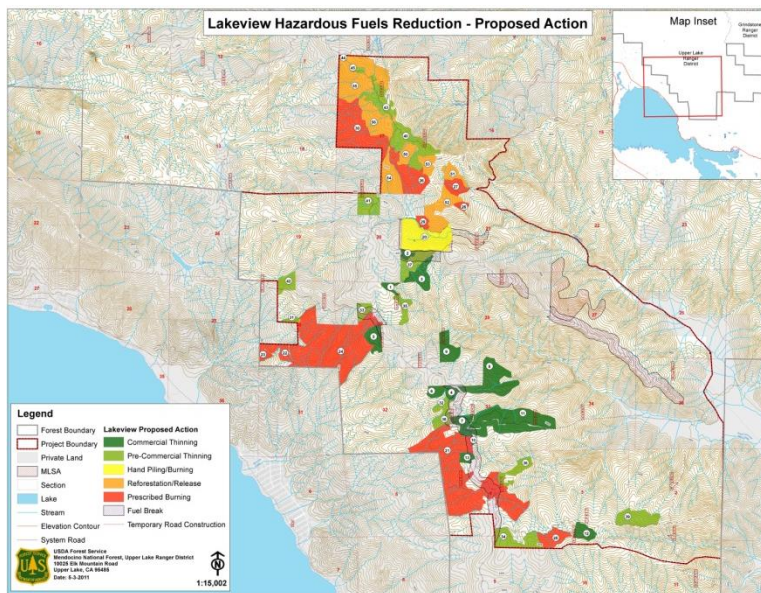


Figure 1. Map of project area.

The Mendocino National Forest, Upper Lake Ranger District proposes to restore resiliency to forest ecosystems and reduce hazardous fuels through a combination of thinning, prescribed fire, planting, piling and mastication on the 2,444 acre Lakeview Hazardous Fuels Reduction Project. Proposed activities would take place in Lake County, California within Township 14N, Range 8W, Sections 2, 3, 4, 10, 11; Township 15N, Range 8W, Sections 8, 16, 17, 19, 20,

21, 22, 26, 27, 28, 29, 30, 32, 33, 34, 35; Township 15N, Range 9W, Section 24, Mount Diablo Meridian. The planning area encompasses approximately 10,800 acres of public and private land, and lies within the Upper Lake Wildland-Urban Interface Defense Zone near the cities of Lucerne, Clearlake Oaks, and Nice. The planning area is located in and around Bartlett Mountain, Long Ridge, and High Valley Ridge, and is accessed via Lake County Roads 303 (Bartlett Springs Road) and 220 (High Valley Road). Land

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management designations within Lakeview HFR proposed treatment areas include Riparian Reserve, Managed Late Successional Area (100-acre LSR), and Matrix.

The most recent harvest activity within the project area was the 2007 High Valley Stewardship Project and post-fire salvage in 1998 following the 1996 Fork Fire. Logging prior to the 1990s initiated early and mid-successional conifer stands with high conifer sapling and pole densities. These initial high densities in conjunction with fire exclusion have contributed to current high ladder fuel concentrations. Excessive concentrations of ladder fuels within the wildland urban interface exacerbate potential wildfire conditions and pose a serious, ongoing threat to life and property.

In the conifer stands along Long Valley Ridge, windstorm events during the past two winters have created conditions where trees and tree tops are broken-off at various heights resulting in thick accumulations of debris. In some cases, the recent windstorm events have led to very high accumulations of suitable brood material for Ips beetles. Due to the size of the material it is possible that the beetles have not yet left the down material for living trees.



Figure 2. Winter storm damage in ponderosa pine stand.

Other areas within the Lakeview Fuels Reduction Project area include approximately 430 acres of stands, which 60 years ago were mature mixed conifer and black oak that have been converted through past harvesting and wildfire to knobcone/shrub cover types. In these stands regenerating conifers and oak are present but are under-represented. Due to the high rates of shrub competition, or in some cases the loss of site capacity, regeneration has slowed and the long-term growth and productivity has been diminished. Without disturbance, black oaks will continue to be outcompeted and overtopped by faster growing shade tolerant conifers such as Douglas-fir, leading to a decline in mast dependent and cavity nesting species. The decline in habitat quality for mast dependent and cavity nesting species does not meet the need of supporting viable populations of all native and desired non-native wildlife and fish species.

Observations

The Mendocino National Forest, Upper Lake Ranger District is requesting WBBi funding for approximately 842 acres of commercial and pre-commercial thinning of natural and plantation stands in the Lakeview Hazardous Fuels Reduction project area. Because of

the marginal economics in treating these stands commercially, the Mendocino National Forest is proposing to offer this project as a Stewardship Integrated Resource Service Contract. The Forest Health Protection funds requested in this document would supplement Northwest Forest Plan funding for hazardous fuels reduction, timber volume production and serve to lower stocking to levels that reduce the risk of bark beetle-caused tree mortality.



Figure 3. Storm damage in ponderosa pine plantations thinned in 2007.

Within the 842 acre project area, 45 year old ponderosa pine plantations (planted in 1966 following the Round Burn) and natural mixed conifer stands of Douglas-fir, ponderosa pine, and sugar pine are exhibiting patches of ponderosa pine mortality from competition induced stress and subsequent attack from western bark beetle. Competition induced insect attack is an indication of overstocking and represents a compelling need for action.



Figure 4. Overly dense stands with storm damage and western pine beetle caused mortality.

In 2007, 176 acres of ponderosa pine plantations within the project area were commercially treated (thinned from below with biomass removed and/or chipped on site followed by light understory burn) to reduce inter-tree competition and increase growth. These thinned areas were subsequently hit by two winters with exceptionally heavy snowfall and high winds

causing abundant stem breakage across residual diameters. Ips attacks are abundant in the down material which ranges from 3 to 8 inches in diameter. Few attacks in the residuals are noticed. It is unlikely that the Ips have moved from the larger material yet as it has not dried sufficiently. There may be sufficient brood developed in the spring to see attacks in the tops of the standing

residuals. The edges of the thinned areas are also showing elevated amounts of western pine beetle activity and subsequent mortality.

The unthinned stands are currently overstocked (SDI 200-400) with large diameter trees (8-30 inch DBH) and are showing signs of western bark beetle mortality. The mortality is concentrated in the unthinned plantations of ponderosa pine, but is also prevalent in overstocked natural stands with a high percentage of ponderosa pine basal area or in clusters of ponderosa pine within mixed-conifer stands especially on the edges of the previously thinned stands with serious amounts of damage from the winters of 2009-2010 and 2010-2011. Mortality is seen in pockets ranging in size from 3-5 trees to 15 or more trees. Red turpentine beetle can be found in the base as high as six feet of many infested trees.

Discussion

The 842 acres of commercial and pre-commercial thinning of natural and plantation stands in the Lakeview Hazardous Fuels Reduction project area proposed by the Mendocino National Forest, Upper Lake Ranger District is needed due to the high level of overstocking and current activity levels of western pine beetle and subsequent mortality. Because of the marginal economics in treating these stands commercially, the Mendocino National Forest is proposing to offer this project as a Stewardship Integrated Resource Service Contract. The Forest Health Protection funds requested in this document would supplement Northwest Forest Plan funding for hazardous fuels reduction, timber volume production and serve to lower stocking to levels that reduce the risk of bark beetle-caused tree mortality.

Current stand density index (a measure of the stocking of a stand based on the number of trees per unit area and diameter at breast height of the tree of average basal area) in the 842 proposed acre project area ranges between 200-400. It is generally thought that at SDI 200 one can expect 20% mortality in pine and mixed conifer stands in northern California. By reducing the SDI to 120-180, as proposed, the District can expect to significantly lower the risk of competition-induced mortality including western pine beetle caused mortality.

It was stated during the visit that thinning would be done from below and across diameters without regard for spacing. This would provide structural diversity within the natural stands. Preservation of species diversity would also reduce risk of continued bark beetle mortality in the stands. Selected leave trees would be determined utilizing tree density, canopy position, and diameter class distribution. This would serve to manage the multiple cohorts. There would also be an emphasis on retaining a substantial large-diameter tree component important for wildlife and fire resiliency. The desired leave tree priority would be as follows: on southerly exposures--black oak, sugar pine, ponderosa pine, and Douglas-fir; on northerly exposures-- black oak, canyon live oak, Douglas-fir, sugar pine and ponderosa pine.

It was recommended at the time of the visit that the larger material and still standing tall stumps from the winter storms be removed or bucked to 2-4 foot lengths during the fall

and winter months of 2011. This will reduce the viability of remaining brood material and reduce the possibility of Ips-caused mortality in the spring. This can be done by using existing fire crews and/or opening the area to firewood cutters.

Summary

The proposed treatments, if fully implemented, will be effective in addressing concerns regarding bark beetles, fire and drought, and will meet the Regional Forester's density management policy that high risk density levels will not be reached again for at least 20 years. I fully support the treatments as described. If you have any questions regarding this report and/or need additional information please contact Cynthia Snyder at (530) 226-2437.

/s/ Cynthia Snyder

Cynthia Snyder
Entomologist
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CC: Gary Urdahl, Frank Aebly, Nancy Mulligan, Sheri Smith, Julie Lydick, Pete Angwin, Phil Cannon

Table 1 Supporting Details Table

Supporting Details	
Forest Type	Plantations and natural forest
Location	Matrix in Upper Lake WUI and 100 acre LSR
Risk Map	Low to Moderate risk for bark beetle mortality
Watershed Classification	This project is not in a priority watershed
Landscape Treatment	2,444 acres treated in total not including surrounding private land
Proposed Treatment	Thinning from below and across diameters
NEPA	Lakeview Hazardous Fuels Reduction (in progress)
Proposed Acres	842
Requested Funding	\$552,868
Total Cost Per Acre	\$657
Matching Funding	\$410,000
Species Composition	ponderosa pine, Douglas-fir, sugar pine, black oak
Current Diameters	8-30 inches DBH
Residual Diameters	10-30 inches DBH
Current Stocking	SDI 200-400
Target Stocking	SDI 120-180
Agents of Concern	Western pine beetle
Recent Activity	Western pine beetle is currently active in many stands, also red turpentine beetle
Current Susceptibility	High due to overstocking and current population activity (western pine beetle)

Appendix

Western pine beetle

The western pine beetle, *Dendroctonus brevicornis*, has been intensively studied and has proven to be an important factor in the ecology and management of ponderosa pine throughout the range of this host species (Miller and Keen 1960). This insect breeds in the main bole of living ponderosa pine larger than about 8 inches dbh. Normally it breeds in trees weakened by drought, overstocking, root disease, dwarf mistletoe or fire. Adult beetles emerge and attack trees continuously from spring through fall. Depending on the latitude and elevation, there can be from one to four generations per year.

Evidence of Attack

Initial attacks are made about mid-bole and subsequent attacks fill in above and below. Pitch tubes are formed on the tree trunk around the entry holes. The pitch tubes are red-brown masses of resin and boring dust. Relatively few, widely scattered, white pitch tubes usually indicate that the attacks were not successful and that the tree should survive. Pheromones released during a successful attack attract other western pine beetles. Attacking beetles may spill over into nearby apparently healthy trees and overwhelm them by sheer numbers.

Life Stages and Development

These beetles pass through the egg, larval, pupal and adult stages during a life-cycle that varies in length dependent primarily upon temperature. Adults bore a sinuous gallery pattern in the phloem and the female lays eggs in niches along the sides of the gallery. The larvae are small white grubs that first feed in the phloem and then mine into the middle bark where they complete most of their development. Bluestain fungi, introduced during successful attacks, contribute to the rapid tree mortality associated with bark beetle attacks.

Conditions Affecting Outbreak

Outbreaks of western pine beetle have been observed, and surveys made, in pine regions of the West since 1899 (Hopkins 1899; cited in Miller and Keen 1960). An insect survey completed in 1917 in northern California indicated that over 25 million board feet of pine timber had been killed by bark beetles. Information from surveys initiated in the 1930s indicates that there were enormous losses attributed to western pine beetle around that time. During the 1930's outbreak, most of the mortality occurred in stands of mature or overmature trees of poor vigor (Miller and Keen 1960). Group kills do not typically continue to increase in size through successive beetle generations as is typical with Jeffrey pine beetle. Rather, observations indicate that emerging beetles tend to leave the group kill area to initiate new attacks elsewhere.

The availability of suitable host material is a key condition influencing western pine beetle outbreaks. In northeastern California, drought stress may be the key condition influencing outbreaks. When healthy trees undergo a sudden and severe moisture stress

populations of western pine beetle are likely to increase. Healthy trees ordinarily produce abundant amounts of resin, which pitch out attacking beetles, but when deprived of moisture, stressed trees cannot produce sufficient resin flow to resist attack. Any condition that results in excessive demand for moisture, such as tree crowding, competing vegetation or protracted drought periods; or any condition that reduces that ability of the roots to supply water to the tree, such as mechanical damage, root disease, or soil compaction, can cause moisture stress and increase susceptibility to attack by the western pine beetle. Woodpeckers and predaceous beetles are natural control agents when beetle populations are low.